August-27-12 10:20:00 AM

Revision ID:	D407-667-205 Crosstube Aft		Accept	*N90004	<b>0100</b> *	Setup Star	1/1/2/1
Start Date: 2	23/05/2012 Start Qty:	1.00 *1:	<b>*</b>	Cust Item ID:			
Required Date: (	06/06/2012 Req'd Qty:	1.00 *1:	*	<b>Customer:</b>			
Reference:							
Approvals:	Process Plan: MCJ	Date: /2/0	<b>3</b> /27Tooling:	Date:		Run Star	"NR1"
	QC:	,	SPC (Y/N):	Date:		Stop	*NR2*
Sequence ID/ Work Center ID	Operation . Description		Set Up/ Run Hours	Tool ID Tool	# Plan Acc Code Qty		Reject Insp. Number Stamp
Draw Nbr	Revision Nbr						
D407-667-245	Rev F/DEO	Tes,					
*100 *100* DC Document Control		emo	0.00 0.00 pels as per PPP 59407-667-265	CHGOOT			
*110 *110* Packaging Packaging	Pick Kit Packaging <b>M</b> o	emo	0.00	Serry	A Designation of the second		12-10-2
120			0.00	1			
*120* CNC Bend I		CHINE - CROSSTUBES	0.00			W	2-10-26
CNC Delta 100 Bende	er 1-I		67-245 using CNC bender progr	ram 407 Aft and			010

	- 4	5/2
NCR:	Yes	No

# WORK ORDER NON-CONFORMANCE / UPDATE

	1.
DQA: Date: 12/11/(1)	
	*
OA Closed: / Date:	

												QA Closed.	O Date.	
Work Orde	r.	Si	178	ろ			DISPOSITION				AGAINST D	EPARTMENT/	PROCESS	``
	lo	D40			205		Rework Scrap Use-as-is Work Order Update		Therm	Skid-tube  Machining  noforming  Large Fab	Crosstube Small Fab Finishing Composite	Pro	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					Desc	rip	tion of work order update	1	nitial	Acti	ion	Sign &		
Cause		Date	Step	Qty			Non-conformance	Ch	ie <b>f/</b> Eng	Descri	iption	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved		12-10-26	120	`	Progra Compai Value non Truba	かないた	riging to improve bent one of the Keypoon the Stuck changing that the program program for ond over bent the	12	11/1	Scrapt de No Repline Replinement ein the work still in the FT. As hide	, 	1291-12	TW 12-11-1	Child Mild
					I		F.	AUL	T CATE	GORY	-			
Landir	ng G	iear					General				'g'.			
	Bending Centre Not Concentric to O/S Bend BOM/Route								Grain Hardwa Inspect	re fon Incomplete	Francy	Ovalized Over/Under Part Incorre	<del></del>	Pressure/Forced Temperature/Cure Weld
		Crushed/C	Crimped.				Burrs		Instruct	ions Incomplete/U	Inclear	Part Lost/M	issing	Wrong Stock Pulled
		Cuffs Contamination				Contamination		Mainte	enance		Part Moved	•		
	Heat Treat Countersink					Countersink		Mislabe	eled		Positioned V			
Inspection Strip in Tube Cut Too Short					Cut Too Short		Misread	d		Power Loss/	Surge 🔀	Other		
Ripples in Bend Drill Holes					Drill Holes						malfuda			
Torque Waves in Extrusion Drawing						Drawing		ł	Calibration		- COMPUL	n Stall Keye	struk.	
Turning Sequence Finish							Out of Sequence - tooling malfaction							
	Wave/Twist in Tube						Folio	L	Outside Dimensions					

August-27-12 10:20:00 AM

Quality Control

Item ID: D407-667-205 Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Aft 23/05/2012 Start Qty: 1.00 **Start Date: Cust Item ID: Required Date:** 06/06/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Approvals: Process Plan: Date: Tooling: Date: Stop Date: SPC (Y/N): Date:\_ Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Reject Accept Reject Insp. **Work Center ID** Description **Run Hours** Code Qty Qty Number Stamp QC15- Crosstube Dimensional Check 130 0.00 \*130\* QC 0.00 Memo

NCR: Y	: Yes / No WORK ORDER NON-CONFORMANCE / UPDATE  QA Closed: Date:													
									-		QA Closed:	Da	ite:	
Work Orde	er: _					DISPOSITION	_			DE	PARTMENT,		<b></b>	
Part N	-					Rework Scrap Use-as-is Work Order Update			Skid-tube Crosstube Wachining Small Fab noforming Finishing Large Fab Composite		4	Water Jet d. Eng. Coor. e/Packaging Supplier		Engineering Quality Other
Root					Descri	ption of work order update	ı	nitial	Action		Sign &			
Cause	İ	Date	Step	Qty		or Non-conformance	Ch	ief Eng	Description		Date	Verificatio	n	QC Inspector
Doc/Data Equip/Tooling Operator Material														
Setup														
Other	$\neg$													
Process														
Supplier														
Training							1							
Unapproved														
						F	AUL	T CATE	GORY					
Landi	ng G	iear				General					-		_	•
	Ш	Bending				Bend		Grain			Ovalized			Pressure/Forced
		Centre No	ot Concei	ntric to	o/s	BOM/Route		Hardwa	re	L	Over/Under			Temperature/Cure
	_	Cracks				Broken/Damaged		1	ion Incomplete	L	Part Incorre		L	Weld
	Crushed/Crimped Burrs			╡		1	tions Incomplete/Unclear	L	Part Lost/M	issing		Wrong Stock Pulled		
	Cuffs Contamination				╡	<u>_</u>	Mainte			Part Moved				
Heat Treat Countersink					Mislabeled Positioned Wrong			_	_	1				
	-	Inspection		Tube		Cut Too Short	Misread Power Loss/Surge Other				Other			
		Ripples in				Drill Holes	_	Offset						
Torque Waves in Extrusion Drawing				Drawing		Out of	Calibration							

Outside Dimensions

Date:

DQA:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

#### Work Order ID 84783

Page 3

August-27-12 10:20:00 AM Item ID: D407-667-205 Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Aft Start Date: 23/05/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 06/06/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Start Approvals: Date: **Tooling:** Date: Stop Date: SPC(Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Reject Accept Reject Insp. Work Center ID Description Run Hours Code Qty Qty Number Stamp 140 0.00 Crosstubes \*140\* Crosstubes 0.00 Memo Crosstubes \*\*\*\*\*\* ENSURE PROPER JIG POSITIONING \*\*\*\*\*\*\*\* 1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes. 2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245Check dimensions between holes on all four sides. 3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins. 4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D407-667-

5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584

245. Drill only the top (2) holes.

as per Dwg D407-667-245

6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Note: Aft side has 3x top holes.

7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes.

8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

9- Scribe tube to identify on the inner chamfer in the cuff D# and B#

											DQA:	Date:		
NCR:	Yes	/ No				WORK ORDER NON-O	100	NFORM	MANCE / UP	PDATE				
											QA Closed:	Date:		
Work Ord	or.					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS		
Part	•					Rework Scrap		r	Skid-tube Machining	Crosstube Small Fab	-	Water Jet	Engineering Quality	
NCR I	No.		· · · · · · · · · · · · · · · · · · ·			Use-as-is Work Order Update			noforming Large Fab	Finishing Composite	Rec/Sto	re/Packaging Supplier	Other	
Root					Descri	ption of work order update		nitial	A	ction	Sign &			
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Des	cription	Date	Verification	QC Inspector	
Doc/Data														
Equip/Tooling														
Operator														
Material	L													
Setup	L													
Other											ļ			
Process														
Supplier														
Training														
Unapproved											<u> </u>			
							AUI	T CATE	GORY					
Landi	ing (	Gear				General		_			_		_	
		Bending				Bend		Grain			Ovalized		Pressure/Forced	
		Centre No	ot Concer	ntric to	o/s	BOM/Route		Hardwa	re		Over/Unde	r tolerance	Temperature/Cure	
		Cracks				Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ect	Weld	
		Crushed/	Crimped			Burrs		Instruct	ions Incomplete	/Unclear	Part Lost/N	1issing	Wrong Stock Pulled	
		Cuffs				Contamination		Mainte	enance		Part Moved	<u> </u>	_	
	Г	Heat Trea	at			Countersink		Mislabe	eled		Positioned	Wrong		
1	Heat Treat					Cut Too Short		Misrear	1		Power Loss/Surge Other			

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

August-27-12 10:20:00 AM

Item ID: Revision ID:	D407-667-20	05		Accept	*N900	040	100	)* s	Setup Sta	rt *N	S1*
Item Name:	Crosstube Aft								Sto	p *N	S2*
Start Date:	23/05/2012	Start Qty: 1.00	*1*		Cust Item 1	ID:					
Required Date	: 06/06/2012	Req'd Qty: 1.00	*1*		<b>Customer:</b>						
Reference:											
Approvals:	Process Pla	n:	Date:	Tooling:	D:	ate:		R	Run Sta	1/1	R1*
	QC:		Date:	<b>SPC (Y/N):</b>	D:	ate:			Sto	*N	R2*
Sequence ID/ Work Center I	D	Operation Description	48	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
			AR LATEX GLOVES WHor surface damage. Repair								
150		QC5- Inspect part compl	eteness to step on W/O	0.00							
*150*											
QC		Memo		0.00						-	
Quality Control		*** WEAR	LATEX GLOVES WHEN	HANDLING CROSSTU	BE***						
160				0.00							
*160*											
HandFXtube		Memo		0.00					- 171		
Hand Finishing Cro	osstubes	*** WEAR	LATEX GLOVES WHEN	HANDLING CROSSTU	BE***						

1- CLEAN CROSSTUBE WITH WASH'N WIPE

											DQA:	Date:	
NCR: \	es /	No				WORK ORDER NON-O	100	NFORM	ANCE / UPI	DATE			
	•										QA Closed:	Date:	
Work Orde	) r:					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
WOIK OIU	=1		<del></del>			Rework	7		Skid-tube	Crosstube		Water Jet	Engineering
Part N	No				<u></u>	Scrap			Machining	Small Fab		d. Eng. Coor.	Quality
						Use-as-is	]		noforming	Finishing	Rec/Sto	re/Packaging	Other
NCR N	No					Work Order Update	]		Large Fab	Composite		Supplier	
Root					Descri	ption of work order update	$\Box$	nitial	Act	tion	Sign &	-	
Cause	[	Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Desci	ription	Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling													
Operator													
Material													
Setup		į											
Other													
Process													
Supplier													
Training													
Unapproved													
						F	AUI	T CATE	GORY				
Landi	ng Gea	r				General		_			_		q
	Be	nding				Bend	L	Grain			Ovalized		Pressure/Forced
	Ce	ntre No	t Concer	ntric to	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
	Cra	acks				Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
	Cru	ushed/C	rimped			Burrs		Instruct	ions Incomplete/	Unclear	Part Lost/M	issing	Wrong Stock Pulled
	Cu	ffs				Contamination		Mainte	enance		Part Moved	_	
	He	at Treat	t			Countersink		Mislabe	eled		Positioned \	<b>V</b> rong	
	Ins	pection	Strip in	Tube		Cut Too Short		Misread	d		Power Loss,	/Surge	Other
	Inspection Strip in Tube Ripples in Bend					Drill Holes	Offset				_	<del></del>	

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

August-27-12 10:20:00 AM

Revision ID:	D40/-66/-2	05		Accept	*N900	0.040	1100	<b>)</b> *	Setup Sta	rt *N	S1*
Item Name:	Crosstube Aft				2.				Sto	P *N	S2*
Start Date:	23/05/2012	Start Qty: 1.00	*1*		Cust Item	ID:					
Required Date	<b>e:</b> 06/06/2012	<b>Req'd Qty:</b> 1.00	*1*		Customer:						
Reference:											
Approvals:	Process Pla	ın:	Date:	Tooling:	D	ate:		F	Run Sta	1/7	R1*
	QC:		Date:	SPC (Y/N):	D	ate:			Sto	*N	R2*
Sequence ID/ Work Center	ID	Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180		Outsource process - NDT	per QSI038 4.1	0.00							
*180* Outsource2		Memo		0.00				-			
Outsource process	- NDT	*** WEAR	LATEX GLOVES WHEN	N HANDLING CROSSTUBE*	**						
		Issue P/O:	trant Inspection as per QS LPI as per AST ch copy of NDT results to	TM 1417							
190				0.00							
*190*		Packaging									
Packaging		Memo		0.00				-			
Packaging		*** WEAR	LATEX GLOVES WHEN	N HANDLING CROSSTUBE*	***						
		Ensure copy	of NDT results attached t	to work order.							
200		QC5- Inspect part comple	eteness to step on W/O	0.00							
*200*											
QC		Memo		0.00					-		
Quality Control		*** WFAR	LATEX GLOVES WHEN	HANDLING CROSSTURE*	**						

NCR: Ye	es /	No									DQA:	Date	•
						WORK ORDER NON-O	CON	NFORN	MANCE / UPI	DATE	QA Closed:	Date	:
						DISPOSITION				AGAINST DE			
Work Order Part No						Rework Scrap		יז	Skid-tube Aachining	Crosstube Small Fab	4	Water Jet d. Eng. Coor.	Engineering Quality
NCR No	o					Use-as-is Work Order Update			Large Fab	Finishing Composite	Rec/Stor	re/Packaging Supplier	Other
Root	ĺ				Descri	ption of work order update		nitial	Act	tion	Sign &		
Cause	D	ate	Step	Qty		or Non-conformance	Ch	ief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved													
Landin	- C						AUL	T CATE	JORY			· · · · · · · · · · · · · · · · · · ·	
Landin	Ben Cen Cru: Cru: Hea Insp	nding  ntre Not  cks  shed/Ci  fs  at Treat  pection  ples in I	Strip in	Tube		General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes Drawing		Instruct Mainte Mislabe Misread Offset	on Incomplete ions Incomplete/ nance led	Unclear	Ovalized Over/Under Part Incorre Part Lost/M Part Moved Positioned N Power Loss/	ct issing Vrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Quality Control

Page 6 August-27-12 10:20:00 AM Item ID: D407-667-205 Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Aft **Start Date:** 23/05/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 06/06/2012 **Req'd Qty:** 1.00 **Customer:** Reference: Run Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_ Tooling: Date: Stop QC: \_\_\_\_ Date: \_\_\_\_ SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Reject Accept Reject Insp. Work Center ID **Description Run Hours** Code Qty Qty Number Stamp 204 0.00 \*201 HandFXtube 0.00 Memo Hand Finishing Crosstubes \*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\* 1- PRESSURE WASH AND THEN USE WASH'N WIPE TO CLEAN CROSSTUBE BEFORE CHEMICAL CONVERSION 206 QC7-Inspect Chemical Conversion Coat 0.00 \*206\*

0.00

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

Memo

											DQA:	Date	•
NCR:	Yes	/ No				WORK ORDER NON-	COL	NFOR!	MANCE / UPDAT	E			
											QA Closed:	Date	•
NAV a mile O med						DISPOSITION			А	GAINST DE	PARTMENT	PROCESS	
Work Ord	ег.				<del></del>	Rework	٦		Skid-tube Cr	osstube		Water Jet	Engineering
Part I	Vo.					Scrap	1 1			mall Fab	Pro	d. Eng. Coor.	Quality
	•					Use-as-is	1		~ <del></del>	inishing		e/Packaging	Other
NCR I	No.					Work Order Update	]		Large Fab Co	mposite		Supplier	
							لب						<del></del>
Root						ption of work order update	1	nitial	Action		Sign &		
Cause		Date	Step	Qty		or Non-conformance	Ch	ief Eng	Descriptio	n	Date	Verification	QC Inspector
Doc/Data	Ш							į					
Equip/Tooling	Ш												
Operator													
Material													
Setup	Ш											Į	
Other													
Process													
Supplier													
Training				,									
Unapproved			<u> </u>				1_						
							AUI	T CATE	GORY				
Landi	_	•			_	General	_	1		_	1	_	<b>-</b> .
	$\vdash$	Bending				Bend	<u> </u>	Grain		<u> </u>	Ovalized	<b> </b>	Pressure/Forced
	Centre Not Concentric to O/S BOM/Route			<b>Ⅎ</b>	<u> </u>	Hardwa		-	Over/Under	<del> </del>	Temperature/Cure		
	Cracks Broken/Damaged				┥ ` ~ ~		1 .	on Incomplete		Part Incorre	<del> </del>	Weld	
	Crushed/Crimped Burrs				_	4	ions Incomplete/Uncle	ar	Part Lost/M		Wrong Stock Pulled		
		Cuffs				Contamination		Mainte	nance		Part Moved		
		Heat Trea	at			Countersink	Mislabeled				Positioned Wrong		$\overline{}$
	Inspection Strip in Tube					Cut Too Short		Misread	i		Power Loss,	'Surge	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

Work Ord August-27-12		783			Page 7							
Item ID: Revision ID: Item Name: Start Date:	D407-667-20 Crosstube Aft 23/05/2012	Start Qty: 1.00	*1*	Accept	*N900		100	ገ*	Setup	p Start Stop	IN.	S1* S2*
Required Date: Reference:	: 06/06/2012	Req'd Qty: 1.00	*1*		Customer:							
Approvals:	Process Pla QC:	n:	Date:	Tooling: SPC (Y/N):		ite:			Run	Start Stop	1/7	R1* R2*
Sequence ID/ Work Center II 210 *210* SprayPaint Spray Painting	D	***Mask un	nderside of crosstube as a decision of crosstube and outside crosstube with Whit	Set Up/ Run Hours 0.00  0.00  EN HANDLING CROSSTUE shown*** e as per DEO D407-667-245 e Imron as per QSI 005 4.2		Tool#	Plan Code	Accep Qty	ot Ro Q		Reject Number	Insp. Stamp

220

QC14- Inspect Spray Paint

0.00

\*220\*

Memo

Finish Time:

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

											D	QA:_	Dat	e:	
NCR:	/es	/ No				WORK ORDER NON-C	O	NFORI\	MANCE / UPE	DATE					
											QA Clos	ed:	Dat	e:	
Work Orde	<b>.</b> r·					DISPOSITION				AGAINST DE	PARTME	ENT/	PROCESS		
WOIR Old	-					Rework	1 <b> </b>		Skid-tube	Crosstube	1		Water Jet	$\neg$	Engineering
Part N	۷o.					Scrap	1		Machining	Small Fab	1	Prod	I. Eng. Coor.		Quality
	-					Use-as-is	1	Therm	oforming	Finishing	] Rec/	Stor	e/Packaging		Other
NCR I	۱o. <sub>-</sub>					Work Order Update			Large Fab	Composite	]		Supplier		
Root					Descri	ption of work order update		nitial	Act	ion	Sign 8	&			
Cause		Date	Step	Qty	C	or Non-conformance	Ch	ief Eng	Descr	iption	Date	2	Verification	1	QC Inspector
Doc/Data															
Equip/Tooling			[								ļ				
Operator											]				
Material															
Setup	Ш											- 1			
Other												ļ			
Process							1					- 1			
Supplier								:							
Training							Ì								
Unapproved											<u> </u>				
						F	AUL	T CATE	GORY						
Landi	ng G	iear				General	_	,			_			_	1
	Ш	Bending				Bend		Grain			Ovalize			_	Pressure/Forced
		Centre No	ot Conce	ntric to	o/s	BOM/Route		Hardwa	re	<u></u>	Over/U	nder	tolerance		Temperature/Cure
	Cracks					Broken/Damaged		Inspecti	on Incomplete		Part Inc	orrec	et		Weld
	Crushed/Crimped					Burrs	L	Instruct	ions Incomplete/l	Jnclear	Part Los	st/Mi	ssing		Wrong Stock Pulled
	Cuffs					Contamination		Mainte	nance		Part Mo	oved			
	Heat Treat					Countersink		Mislabe	led		Position	ned W	Vrong		-
		Inspectio	n Strip in	Tube		Cut Too Short		Misread	i		Power l	Loss/S	Surge	L	Other
		Ripples in	Bend			Drill Holes		Offset							

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

August-27-12 10:20:00 AM

Quality Control

Item ID: Revision ID: Item Name:	D407-667-20 Crosstube Aft			Accept	*N900	040	100	<b>)*</b> s	Setup Sta	ΙVI	S1*
Start Date: Required Date Reference:	23/05/2012 :: 06/06/2012	Start Qty: 1.00 Req'd Qty: 1.00	*1 <sup>*</sup>		Cust Item I Customer:	ID:				IV	.J/
Approvals:	Process Pla	ın:	Date:	Tooling:	D	ate:	_	F	Run Sta	1/1	R1*
	QC:		_ Date:	<b>SPC (Y/N):</b>	D	ate:			Sto	*N	R2*
Sequence ID/ Work Center I	ID	Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
*230 *230* Crosstubes Crosstubes		up. A/R Prose  2- Lightly s with 41058  3-Install sup D407-667-2 A/R Sc	al 890 Batch:  EXP:  cuff the bonded area uwash 'n' wipe  poort with Scotch-Weld DP460 B  EXERT	0.00  0.00  EO D407-667-245.Top holes sh  using a 320 grit sand paper and ld DP460 and install clamps as jig DT9025. Torque clampsas atch:  KP:  407-667-245. Touch-up rivet h	clean the area per DEO Dwg per dwg						
240 * <b>24</b> 0* QC		QC5- Inspect part comp	eteness to step on W/	O 0.00 0.00							

											DQA:	Date:				
NCR:	⁄es	/ No				WORK ORDER NON-O		NFORM	//ANCE / UPDA							
											QA Closed:	Date:				
Work Orde	-r·					DISPOSITION	Rework Scrap Wachining Small Fab Prod. Eng. Coor. Rec/Store/Packaging Supplier Supplier Supplier FAULT CATEGORY  Rework Scrap Wachining Small Fab Prod. Eng. Coor. Rec/Store/Packaging Supplier									
WOIK OIU	=1				<del></del>	Rework	1		Skid-tube	Crosstube		Water Jet	Engineering			
Part N	No.					. ⊢		l .	} <u>-</u>		Pro		Quality			
	-					· —	1	Therm	noforming	Finishing	Rec/Stor	e/Packaging	Other			
NCR N	۱o. <u>-</u>					Work Order Update	]		Large Fab C	Composite		Supplier				
Root					Descri	ption of work order update	Ţ	nitial	Action	1	Sign &					
Cause		Date	Step	Qty		or Non-conformance	Ch	ief Eng	Descript	ion	Date	Verification	QC Inspector			
Doc/Data																
Equip/Tooling																
Operator																
Material								٠								
Setup																
Other																
Process																
Supplier																
Training	П		ļ													
Unapproved	П															
						F	AUL	T CATE	GORY							
Landi	ng G	iear				General		_			_		<del>_</del>			
		Bending				Bend		Grain			Ovalized		Pressure/Forced			
		Centre No	ot Conce	ntric to	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure			
	Cracks					Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld			
	Crushed/Crimped					Burrs		Instruct	ions Incomplete/Unc	lear	Part Lost/M	issing	Wrong Stock Pulled			
	Cuffs					Contamination		]Mainte	enance		Part Moved	_				
	Heat Treat					Countersink		Mislabe	led		Positioned V	Vrong				
		Inspectio	n Strip in	Tube		Cut Too Short		Misread	<del>j</del>		Power Loss/	Surge	Other			
	$\Box$	Ripples in	Bend			Drill Holes		Offset			-					

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

August-27-12 10:20:00 AM

Item ID: Revision ID: Item Name:	D407-667-20 Crosstube Aft	5		Accept	*N900	<b>040</b>	100	<b>)*</b> s	etup Star Sto <sub>l</sub>	14	S1*
	23/05/2012	Start Qty: 1.00 Req'd Qty: 1.00	*1* *1*		Cust Item II Customer:	D:				· NI	S2*
Approvals:	Process Plan	n:	Date:	_ Tooling:	Da	te:		R	tun Star	1/1	R1*
	QC:		Date:	_ SPC (Y/N):	Da	te:			Stop	` *N	R2*
Sequence ID/ Work Center II	)	Operation Description Pick Kit		Set Up/ Run Hours , 0.00	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
*250* Packaging Packaging		Мето		0.00							
<sup>260</sup> *2հՈ*		QC4- 100% Inspect kits	for completeness	0.00							
QC Quality Control		Мето		0.00							
270		Packaging		0.00							
*270* Packaging Packaging		Memo	in kanban rack	0.00						<u> </u>	

											DQA:	Date	
NCR:	Yes	/ No				WORK ORDER NON-C	O	NFORN	/IANCE / UP	DATE	OA Closed:	Date	•
Work Order:  Part No.  Part No.  Work Order Use-as-is Work Order Update Use-as-is Gaulor/Tooling Cause Date:  Rework Cause Date Step Qty Description of work order update Cause Date Step Qty Or Non-conformance Chief Eng Description Date Verification Date Verification Date Verification Date Verification Date Verification Chief Eng Description Date Verification Date Verifi													
Work Orde	er: _						,		<del>1</del>			<b></b>	¬
Part f	No					Scrap		ſ	Machining	Small Fab	1	d. Eng. Coor.	Engineering Quality Other
NCR I	No	<del></del>			· · · · · · · · · · · · · · · · · · ·	Work Order Update			Large Fab	Composite		Supplier	
Root	T				Descri	ption of work order update		nitial	Ac	tion	Sign &		
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Desc	ription	Date	Verification	QC Inspector
Equip/Tooling Operator Material Setup													
	Н												
	Н												
	П												
_	П												
	··········					F	ΑUL	T CATE	GORY				
Landi	ng G	ear			···	General					_		
		Bending				Bend		Grain			Ovalized		Pressure/Forced
		Centre No	ot Conce	ntric to	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
		Cracks				Broken/Damaged		Inspect	ion Incomplete		Part Incorre	ct	Weld
		Crushed/Crimped				Burrs	L	Instruct	ions Incomplete,	/Unclear	Part Lost/M	issing	Wrong Stock Pulled
	Cuffs					Contamination		Mainte	enance		Part Moved		
	Heat Treat					Countersink		Mislabe	eled	<u></u>	Positioned \	Wrong	
		Inspectio	n Strip in	Tube		Cut Too Short		Misread	t		Power Loss,	'Surge	Other `
		Ripples ir	Bend		[	Drill Holes		Offset					
		Torque W	aves in E	Extrusio	n 🗀	Drawing		Out of	Calibration				

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Finish

Quality Control

August-27-12 10:20:00 AM Item ID: D407-667-205 Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Aft 23/05/2012 Start Date: Start Qty: 1.00 **Cust Item ID: Required Date:** 06/06/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Start Process Plan: \_\_\_\_\_ Date: \_\_\_\_ Tooling: Approvals: Date: Stop Date: **SPC (Y/N):** Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Reject Reject Accept Insp. Work Center ID Description **Run Hours** Code Qty Qty Number Stamp QC21- Final Inspection - Work Order Release 280 0.00 \*280\* 0.00 Memo

MC 12-11-02

NCR: Y	es / No				WORK ORDER NON-C	CONF	ORN	MANCE / UP	DATE			
					<b>.</b>			···		QA Closed:	Date	2:
Work Orde	r:				DISPOSITION				AGAINST DE	PARTMENT	PROCESS	
VVOIR Orde					Rework	1		Skid-tube	Crosstube	]	Water Jet	Engineering
Part N	0.				Scrap	1		Machining	Small Fab	Pro	d. Eng. Coor.	Quality
				· · · · ·	Use-as-is	<b>   </b> <sub>1</sub>		noforming	Finishing		e/Packaging	Other
NCR N	0.				Work Order Update	1		Large Fab	Composite	1	Supplier	
										·		
Root					ption of work order update	Init			tion	Sign &		
Cause	Date	Step	Qty		or Non-conformance	Chief	Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data												
Equip/Tooling	_											
Operator		1										
Material												
Setup	_											
Other	4											
Process	_											
Supplier	_											
Training	_											
Unapproved						AULT (	CATE	CORV		<u> </u>	1	
Landin	g Gear				General F	AULI	CATE	GUNT				
Landin	Bending			Г	Bend	Па	rain			Ovalized	Г	Pressure/Forced
-		ot Conce	ntric to 1	~/s	BOM/Route	$\vdash$	ardwa	ero.	<u> </u>	Over/Under	tolerance	Temperature/Cure
	Cracks	or conce	inche to v	<sup>5</sup> ,5	Broken/Damaged	$\vdash$		ion Incomplete		Part Incorre	<b>⊢</b>	Weld
ŀ		Cracks Crushed/Crimped			Burrs	<del></del>	•	ions Incomplete	/Unclear	Part Lost/M	<u>+</u>	Wrong Stock Pulled
-	Cuffs	cimped			Contamination			enance	- Oncical	Part Moved		
}	Heat Treat				Countersink	<del></del>	lislabe		-	Positioned \	Vrong	
-		on Strip in	Tube	<u> </u>	Cut Too Short	<b>├</b>	lisread		<del> </del>	Power Loss/		Other
ŀ	Ripples in	•			Drill Holes		ffset		<u> </u>	ب · · ·,	<u> </u>	
	<b></b>   ``	Vaves in E	Extrusio	,	Drawing	1		Calibration				

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

## **Picklist Print**

August-27-12 10:20:04 AM

Work Order ID: 84783

\*84783\*

Parent Item:

D407-667-205

\*D407-667-205\*

Parent Item Name: Crosstube Aft

**Start Date:** 23/05/2012

**Required Date:** 06/06/2012 -

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:C 05.09.02 Add holes for compatibility with Bell SkidtubesKJ/JLM

IPP Rev:D Added Magnobond, Rubber Cushion & Clamps

\*\*\*\*CHANGE FO CHG 005 - IF USING D2894-1 B35578 OR GREATER\*\*\*\* IPP Rev:E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified

by:EC

JLM

IPP Rev:F 08-06-12 add comment in seq. 24 DD verified by:EC

IPP Rev:G 08-08-19 revE as per dwg DD verified by:EC

IPP Rev H 09.01.06 ECN 08-562 EC verified by:DD IPP Rev:I 10.04.07 revise route seq. in bom DD verified by:JLM IPP Rev. J 11.04.26

removed abrasion strip ecn 11-551 EC verified

by:DD

IPP REV:K

1069059

11.10.03 DEO D407-667-245-F-2 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D407-667-205TRN		Manufactured	No			110	Each	1.0000	1	1_0	$\sim$		
*D407-66 Crosstube Turning Detail	7-205TF	SN*							**	01)		12-10	592
				<b>Location</b>		Loc	Oty	Loc Code					
				LG	86417		1 1			(1)	-		
AN960JD516	NAS1149D0563J	Purchased	No			230	Each	2.0000	18	18			
*AN960.IF	)516*								**		<del>-</del>		
				Location		Loc	Qty	Loc Code					
				ST338			2						

2

											DQA:	Da	te:	
NCR:	Yes	/ No				WORK ORDER NON-O	CON	NFORM	AANCE / UPDATE		·		•	
											QA Closed:	Da	te:	
Work Ord	or.					DISPOSITION			AGA	NINST DE	PARTMENT	PROCESS		
WOIR OIG	C1.					Rework	1		Skid-tube Cross	stube		Water Jet		Engineering
Part f	No.					Scrap	1	1	<b></b>	II Fab	Pro	d. Eng. Coor.		Quality
						Use-as-is	]		~ <b>—</b>	shing	Rec/Stor	e/Packaging	_	Other
NCR I	No.					Work Order Update			Large Fab Comp	osite		Supplier	Ш	
Root					Descri	ption of work order update	Π	nitial	Action		Sign &			
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Description		Date	Verificatio	n	QC Inspector
Doc/Data	Ш											:		
Equip/Tooling														
Operator														
Material	Щ													
Setup	$\square$													
Other	Ш						1					i		
Process	Ш													
Supplier	Ш													
Training	Ш		1				ļ							
Unapproved							<u> </u>							
						· · · · · · · · · · · · · · · · · · ·	AUL	T CATE	GORY					
Landi					<del></del>	General	_	1			٦			1 .
	-	Bending			ļ	Bend	<u> </u>	Grain		<u> </u>	Ovalized		_	Pressure/Forced
	-	Centre N	ot Conce	ntric to (	o/s	BOM/Route	_	Hardwa			Over/Under		_	Temperature/Cure
	$\vdash$	Cracks				Broken/Damaged		4	on Incomplete	<u> </u>	Part Incorre		_	Weld
	$\vdash$	Crushed/	Crimped			Burrs		1	ions Incomplete/Unclear	<u> </u>	Part Lost/M	-		Wrong Stock Pulled
	Ш	Cuffs				Contamination		Mainte			Part Moved			
	-	Heat Trea				Countersink	L	Mislabe	eled		Positioned \	_	_	-
	Ш	Inspectio	n Strip in	Tube		Cut Too Short		Misread	d .	L	Power Loss/	'Surge	L	Other
		Ripples in	n Bend			Drill Holes	L	Offset						

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

### **Picklist Print**

August-27-12 10:20:04 AM

Work Order ID: 84783

Parent Item:

D407-667-205

Parent Item Name: Crosstube Aft

\*84783\* \*D407-667-205\*

**Start Date: 23/05/2012** 

**Required Date:** 06/06/2012

Start Qty: 1.00

Required Qty: 1.00

D2873-043 \*D2873-043\*

\*D2873-045\*

Manufactured

230

Each

2

6

48.0000

Loc Code

2

\*\*

Nut Plate Assembly

Manufactured

Location

Location

LG052

LG052

Location

LG052

82949 84386

72644

40 230 Each

Loc Oty

Loc Qty

3

5

Each

Loc Qty

1.0000

Loc Code

2

2

\*\*

Nut Plate Assembly

D2873-045

2.750 Support

D2894-1

D3190-1

\*D2894-1\*

Manufactured No

Manufactured

82947

82007

85797

230 Each

8.0000

\*\*

Loc Code

33.0000

\*\*

\*D3190-1\*

**Chafing Shield** 

Location Loc Oty Loc Code LG053 23 75947 23

230

LG055 72576 10 10

											DQA:	Date	
NCR:	Yes /	No				WORK ORDER NON-C	COI	NFORM	/ANCE / UPI	DATE	QA Closed:	Date	
Maril Ond			· · ·			DISPOSITION				AGAINST DE			
Work Orde Part I NCR I	No					Rework Scrap Use-as-is Work Order Update		Therm	Skid-tube  Machining noforming  Large Fab	Crosstube Small Fab Finishing Composite	4	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root	1	ſ			Descri	ption of work order update		nitial	Act	tion	Sign &	··· ··	T
Cause	1	Date	Step	Qty		or Non-conformance	1	ief Eng		ription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved	ng					E	ALI	T CATE	GORY				
Landi	ng Gea	r				General	AUL	.I CAIE	JONT			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
Landi	Bending Centre Not Concentric to O/S Cracks Crushed/Crimped Cuffs Heat Treat Inspection Strip in Tube Ripples in Bend Torque Waves in Extrusion					Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes Drawing		Instruct Mainte Mislabe Misread Offset	ion Incomplete tions Incomplete/I enance eled	Unclear	Ovalized Over/Under Part Incorre Part Lost/M Part Moved Positioned \ Power Loss/	ct issing Vrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
	10	rque W	aves in E	:xtrusio	n	lurawing	1	JOut of (	Lalibration				

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Finish Folio

August-27-12 10:20:04 AM

Work Order ID: 84783

Parent Item:

D407-667-205

Parent Item Name: Crosstube Aft

\*84783\*

\*D407-667-205\*

**Start Date:** 23/05/2012

\*\*

**Required Date:** 06/06/2012

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured

230

Each

165.0895

2

\*D3595-063-450\*

Location	<u>Lo</u>	c Oty	Loc Code		
LG		0.28			
82511		0.28			
LG051		154.7			
80161		1.7			
84715		3			
87478		130			
87958		20			
MAT052	10.1	09474			
67353		2			
68893		6			
70113		0.56			
71354		0.2			-
74113	0.3	49474			
75597		1			
	230	Each	190.0000	14	14

MS20601-AD4W8

Purchased

No

\*\*

\*MS20601-AD4W8\* RIVET

Location	Loc Oty	Loc Code	
311	45		
122452	45		
LG051	33		
121017	33		
ST314	101		
121827	1		
122141	100		
ST322	11		***
121255	11		

											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-O	CON	NFORN	MANCE / UPDA	TE			
											QA Closed:	Date:	
Work Ord	er.		•			DISPOSITION				AGAINST DEI	PARTMENT	PROCESS	
Part l	•			<u>-</u>		Rework Scrap			<b>⊢</b>	Crosstube Small Fab	Pro	Water Jet d. Eng. Coor.	Engineering Quality
NCR I	No.					Use-as-is Work Order Update			noforming Large Fab C	Finishing Composite	Rec/Stor	re/Packaging Supplier	Other
Root					Descri	ption of work order update		nitial	Action	1	Sign &		
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Descript	ion	Date	Verification	QC Inspector
Doc/Data											!		
Equip/Tooling								ļ					
Operator													
Material													
Setup													
Other							1						
Process			1										
Supplier													
Training													
Unapproved													
						F	AUL	T CATE	GORY				
Land	ing (	Gear	-			General		_			_		_
		Bending				Bend		Grain			Ovalized	L	Pressure/Forced
		Centre N	ot Concer	ntric to (	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
		Cracks				Broken/Damaged		] Inspecti	on Incomplete		Part Incorre	ct	Weld
		Crushed/	Crimped.			Burrs	Γ	Instruct	ions Incomplete/Unc	lear	Part Lost/M	issing	Wrong Stock Pulled
		Cuffs				Contamination		Mainte	nance		Part Moved	<del></del>	_
		Heat Trea	at			Countersink		Mislabe	led		Positioned \	Vrong	
		Inspectio	n Strip in	Tube		Cut Too Short		Misread	1		Power Loss/	Surge	Other

Offset

Out of Calibration
Out of Sequence

Outside Dimensions

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drill Holes

Drawing

Finish Folio

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

August-27-12 10:20:04 AM

Work Order ID: 84783

Parent Item:

MS21920-22

D407-667-205

Parent Item Name: Crosstube Aft

\*84783\*

\*D407-667-205\*

**Start Date: 23/05/2012** 

**Required Date:** 06/06/2012

Start Qty: 1.00

Required Qty: 1.00

Clamp(per MIL-DTL-8783C)

Purchased

Purchased

No

No

230

Each

74.0000

\*\*

Location	<u>1</u>	<u>Lo</u>	c Oty	Loc Code		
LG			ı			
	119545		1			
LG050			73			
	116207		7			
	117506		1			
	118186		8			
	120631		7			
	122518		50			
		230	Each	72.0000	2	2
				t e	<b>*</b> *	

MS21920-25

Clamp(per MIL-DTL-8783C)

Location	Loc Qty	Loc Code
LG050	72	
116264	2	
117998	4	
118142	4	
119339	2	
119746	2	
120475	7	
120920	46	
122204	5	

NCR:	⁄es	/ No				WORK ORDER NON-O	O	NFORM	AANCE / UPDA	<b>NTE</b>	·		
											QA Closed:	Date	
Work Ord	er:					DISPOSITION				AGAINST DE	PARTMENT/	PROCESS	
	- No					Rework Scrap Use-as-is Work Order Update		Therm	Machining noforming	Crosstube Small Fab Finishing Composite	4	Water Jet d. Eng. Coor. e/Packaging Supplier	Engineering Quality Other
Root Cause		Date	Step	Qty		ption of work order update	1	nitial iief Eng	Actior Descript		Sign & Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved								T CATE					
Landi	ng G	ear				General							
		Bending Centre No Cracks Crushed/G Cuffs Heat Trea nspection	Crimped t 1 Strip in Bend	Tube		Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes		Instruct Mainte Mislabe Misread Offset	ion Incomplete ions Incomplete/Unc enance eled	clear	Ovalized Over/Under Part Incorred Part Lost/Mi Part Moved Positioned V Power Loss/	ct ssing Vrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
	1	forque W	aves in E	xtrusio	n	Drawing	1	[Out of 0	Calibration				

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

# **Picklist Print**

August-27-12 10:20:04 AM

Work Order ID: 84783

Parent Item:

D407-667-205

Parent Item Name: Crosstube Aft

\*84783\*

\*D407-667-205\*

**Start Date:** 23/05/2012

**Required Date:** 06/06/2012

Start Qty: 1.00

Required Qty: 1.00

AN5-10A Purchased No

250

Each

397.0000

10 10

\*\*

\*AN5-10A\*

<b>Location</b>	Loc Qtv	Loc Code	
ST337	297		
118191	80		
121243	100		
122151	117		-
ST362	100		<del></del>
122800	100		

AN5-32A

Purchased

No

250 Each 301.0000

\*\*

Bolt

Locatio	<u>n</u>	<u>Lo</u>	c Qty	Loc Code		
ST337			100			
	122416		50			
	122800		50			
ST339			101			
	120423		5			
	122151		96			
ST340			100			
	121541		100			
		250	Each	90.0000	4	4

AN5-34A

Purchased

No

\*\*

\*AN5-34A\*

<b>Location</b>	Loc Qty	Loc Code	
339	25		
121181	25		<del> </del>
ST337	50		
122416	50		
ST339	15		
120423	15		

August-27-12 10:20:04 AM

**Shop Packet Print** 

Page 5

												DQA:	Da	ate:	
NCR:	Yes	/ No				WORK ORDER NON-	COI	NFORM	MANCE / UPI	DATE		•			
						<b>.</b>		<i>-</i>			C	QA Closed:	Da	ate:	
Work Orde	or.					DISPOSITION				AGAINST DE	EΡ	ARTMENT/	PROCESS		
Work Ora	-		-			Rework	1		Skid-tube	Crosstube	7		Water Jet		Engineering
Part f	No.					Scrap		ŧ	Machining	Small Fab	1	Prod	d. Eng. Coor.	$\vdash$	Quality
	-					Use-as-is	1	Therm	noforming	Finishing	1	Rec/Stor	e/Packaging		Other
NCR I	۷o.					Work Order Update			Large Fab	Composite			Supplier		
		· · · · · · · · · · · · · · · · · · ·		,					<u> </u>		_		<del> </del>		
Root						ption of work order update	1	Initial	Act			Sign &		,	
Cause		Date	Step	Qty	(	or Non-conformance	Cr	nief Eng	Descr	iption	$\downarrow$	Date	Verification	'n	QC Inspector
Doc/Data															
Equip/Tooling	Щ										1				
Operator							1								
Material															
Setup															
Other					3										
Process	Щ														
Supplier	Ш						1				1				
Training	Ш										ĺ				
Unapproved			L								$\bot$				
							AUI	LT CATE	GORY						
Landi						General		٦		<del></del>	_			_	1
	-	Bending				Bend	$\vdash$	Grain		ļ	┥.	Ovalized		$\vdash$	Pressure/Forced
	${f -}$	Centre No	ot Concer	ntric to	o/s	BOM/Route	<u> </u>	Hardwa				Over/Under		$\vdash$	Temperature/Cure
	$\vdash \vdash$	Cracks				Broken/Damaged	<u> </u>	-1	on Incomplete	<u> </u>	-	Part Incorred		$\vdash$	Weld
1	$\boldsymbol{\vdash}$	Crushed/	Crimped			Burrs	<u></u>	-1	ions Incomplete/l	Jnclear	н.	Part Lost/Mi	ssing		Wrong Stock Pulled
	⊢⊣	Cuffs				Contamination		Mainte		_	-1	Part Moved			
	Ш	Heat Trea	t			Countersink		Mislabe	eled		_	Positioned V	Vrong		•
		Inspection	n Strip in	Tube		Cut Too Short		Misread	i		ļ	Power Loss/	Surge		Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

August-27-12 10:20:04 AM

Work Order ID: 84783

Parent Item:

D407-667-205

Parent Item Name: Crosstube Aft

\*84783\*

\*D407-667-205\*

**Start Date:** 23/05/2012

**Required Date:** 06/06/2012

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased

No

250

Each

1,616.000

\*\*

\*MS21042L5\*

<b>Location</b>	Loc Qty	Loc Code	
300	488		
121652	488		
314	1000		
122452	1000		
ST300	128		
108827	4		
116105	1		
116548	43		
119109	68		
2937	12		

NCR:	/es	/ No				WORK ORDER NON-C	CON	NFORM	MANCE / UPE	DATE			
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NCR N	-					Use-as-is Work Order Update			noforming Large Fab	Finishing Composite	Rec/Sto	re/Packaging Supplier	
Root						ption of work order update		nitial	Act		Sign &		
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Descr	iption	Date	Verificatio	n QC Inspector
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	-	Ripples in		, asc		Drill Holes	$\vdash$	Offset	•	L		y suige	
	-	Torque W		xtrusio	n	Drawing		-	Calibration				

Outside Dimensions

Date:

DQA:

Turning Sequence

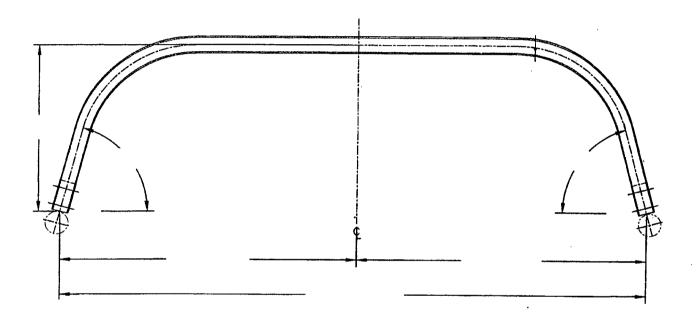
Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DART AEROSPACE LTD	Work Order:	84783	
Description: Crosstube High Aft (407)	Part Number:	D407-667-205	
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1	

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	45.79	46.05
Angle	54	56
Total Span	91.58	92.100



 	Comme	nts	 
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QC15 Inspection	
Date	

Approved	Revised by	Change	Date	Rev
	KJ/JM	New Issue	07.02.06	Α
	KJ	Dwg Rev updated	09.06.22	В
	KJ i/\	Dimensions updated	11.08.22	С
F	KJ (ZX	Dimensions updated	11.09.30	D
\$			11.09.30	D

# **Dart Aerospace Ltd**

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DATE	STEP	Description of NC	Corrective Action Section B			Sign & Verifica		ation Approval	Approval
	0.2.	Section A	Initial Chief Eng	Action Description Chief Eng	Date	Section	on C	Chief Eng	QC Inspector

NOTE: Date & initial all entries

I te m	QTY -245	PART NUMBER	DESCRIPTION
1	Х	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	11	D6011-115	CROSSTUBE
3	2	<b>□</b> 2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
ļ			
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC, 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

#### **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6011-115
- FINISHED LENGTH = 112.91±0.020 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
- PAINT OUTSIDE PER DART QSI 005 4.2 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 27.7 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
  RUN-OFF PART, BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT ÚSING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE
  - NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY, CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY RETURN TO ENGINEERING UNCONTROLLED COPY SUBJECT TO AMENDMENT WITHOUT NOTICE WORK ORDER MLJ 0. 24703 MLJ 12/05/23

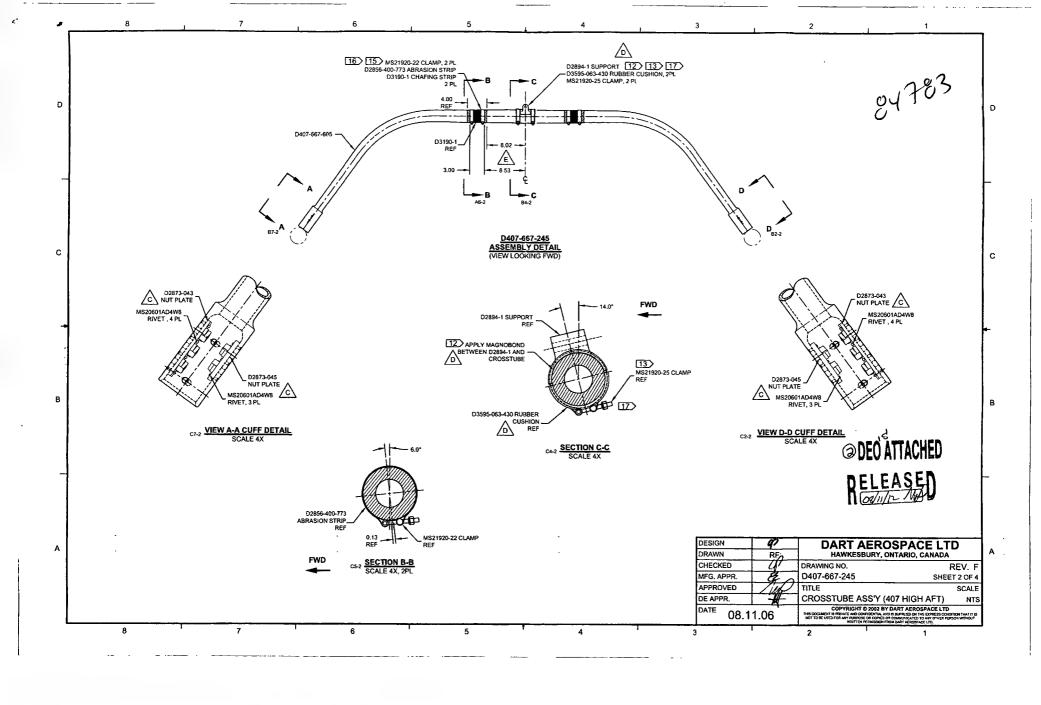
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REV.			DESCRIPTION	BY	DATE
Α	NEW IS	SUE		CP	02.05.13
В	ADD CHAFING SHIELD			CP	03.05.21
С	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES		PH	05.07.26	
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -861 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION			PH	07.02.07
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225			мв	08.07.24
F	RELOC/	MAT NOTES 1 ATED FLAG # ED REF. & AL	RF	08.11.06	

DESIGN	qp	DART AEROSPACE LTD			
DRAWN	RF <sub>2</sub>	HAWKESBURY, ONTARIO, CANAD			
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MFG. APPR.	8	D407-667-245 SHI	EET 1 OF 4		
APPROVED	111	TITLE	SCALE		
DE APPR.	74	CROSSTUBE ASSY (407 HIGH AFT)	NES		
DATE 08.1	1.06	COPYRIGHT © 2002 BY DART AEROSPACE LT	NOTIFIED THAT IT IS		

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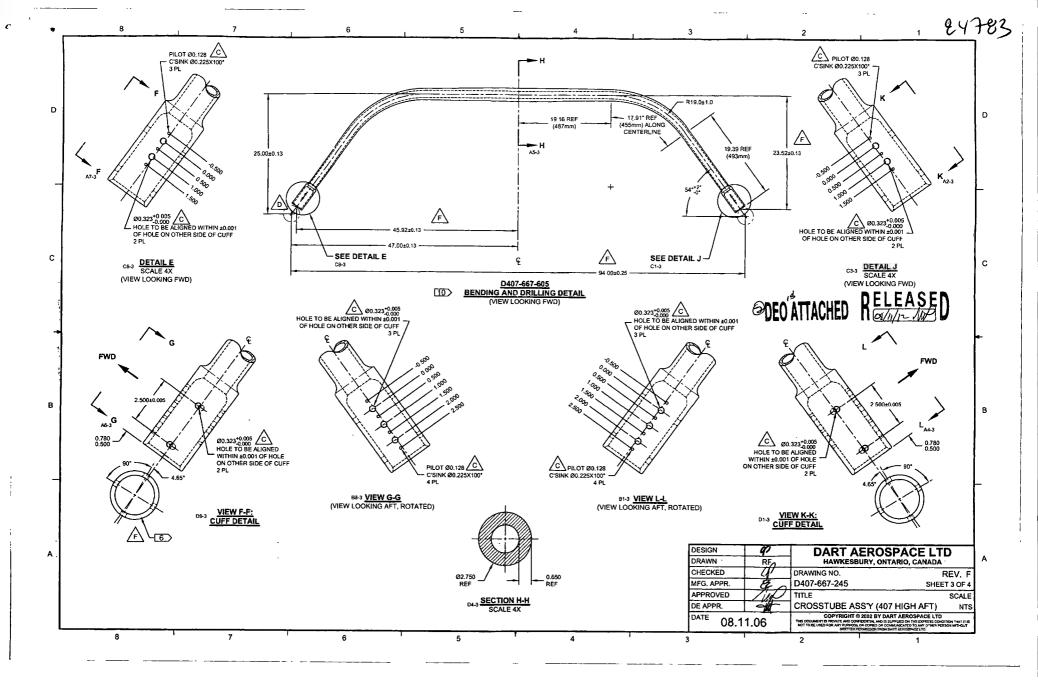
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NOTE: Date & initial all entries



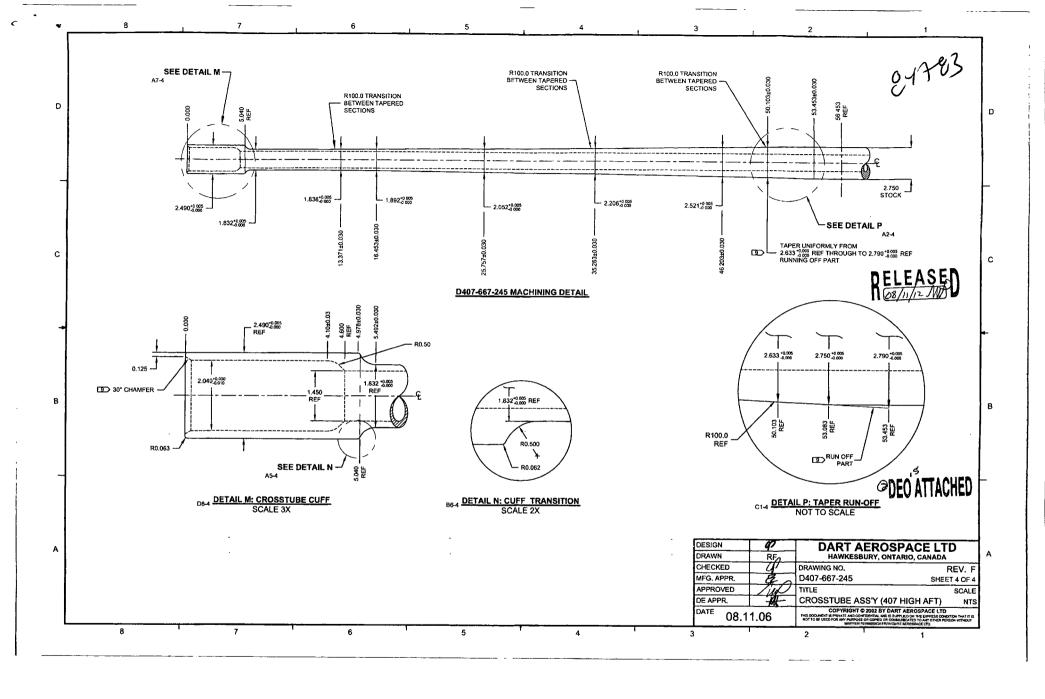
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DRAWING NO. D407-667-245	TITLE CROSSTUBI	E ASSY (407 HI	REV. F GH AFT)	DART AEROSPACE LT ENGINEERING ORDE		SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN		CHECKED	9	MFG. APPR.	APPROVED /LO	DE APPR.	NIS
DATE 11.04	.08	DATE 11.	04.12	DATE 11.04.12	DATE 11.04.12	DATE 11-04-12	

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

Qty -245	Part Number	Description
0	D2856-400-773	ABRASION STRIP
-		-245

#### WAS:

3	2	D2856-400-773	ABRASION STRIP

## NOTES 2 AND 15, SHEET 1 ARE AMENDED AS FOLLOWS:

IS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND

PAINT OUTSIDE PER DART QSI 005 4.2

REMOVE MASKING AND APPLY CLEAR COAT

15) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1 CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

#### WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.



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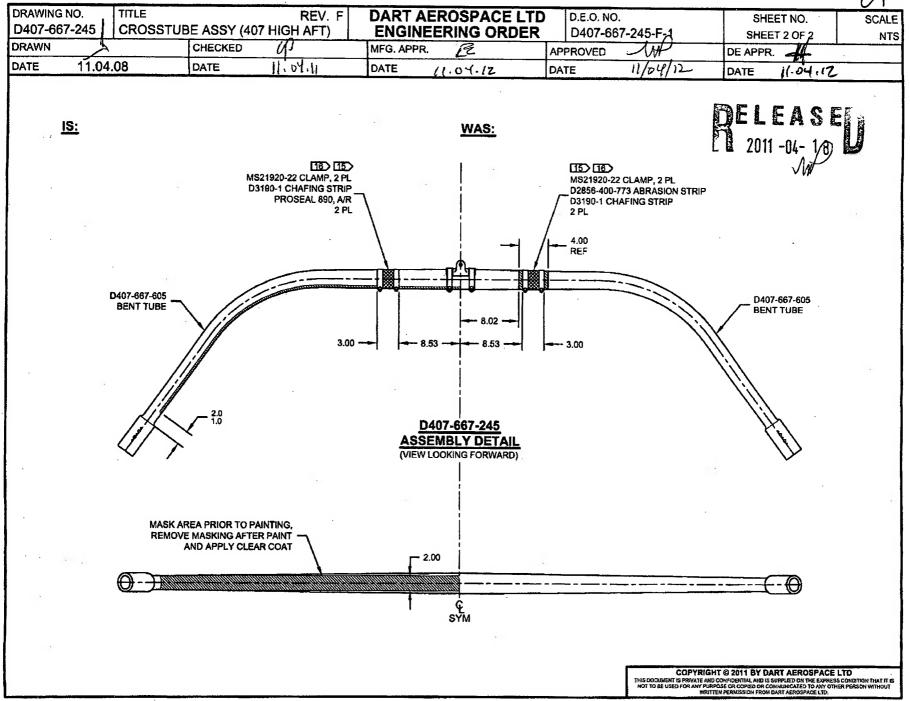
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DRAWING NO.	TITLE	REV. F	DART AE	ROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D407-667-245	CROSSTUBE ASS'Y (	407 HIGH AFT)	ENGINE	<b>ERING ORDER</b>	D407-667-245-天-2	SHEET 1 OF	NTS
DRAWN 97	CHECKED	ASS	MFG. APPR.	E	APPROVED W	DE APPR.	
DATE 11.09	07 DATE	11.09.19	DATE	11-09-19	DATE 11.09.19	DATE 11.09.19	

**PURPOSE:** 

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

04782

### CHANGE:

IS:

Item	Qty -245	Part Number	Description
12	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

## WAS:

12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 17, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

#### WAS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



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